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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/680,308	10/06/2000	Hubertus J.M. Bosman	PM 274361 9271US/CON/WO	9025

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EXAMINER
GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
1764	12

DATE MAILED: 08/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-12

Office Action Summary	Application No.	Applicant(s)	
	09/680,308	BOSMAN ET AL.	
	Examiner	Art Unit	
	Walter D. Griffin	1764	

-- The MAILING DATE of this communication appears on the cover sh t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 23, 2002 has been entered.

Response to Amendment

The rejections under 35 U.S.C. § 112 and 103 as described in paper no. 7 have been withdrawn in view of the amendment filed on July 24, 2002 and the request for continued examination. The following includes new rejections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-12, 14, 15, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smoker (2,399,514) in view of Gattuso et al. (4,734,540).

The Smoker reference discloses a process for hydrogenating phenyl acetylene in a styrene-containing stream by contacting the stream with a catalyst in the presence of hydrogen at hydrogenation conditions. The phenyl acetylene content of the styrene-containing stream may vary from fractions of a percent up to 8% and higher and the styrene content is at least 30%. The catalyst comprises nickel supported on a carrier. Sulfur is not disclosed as being present in the catalyst. Conditions include temperatures ranging from 25° to 400°C. Hydrogen to 100% styrene weight ratios range from 0.01 to 0.5. Since phenyl acetylene concentrations in the styrene stream range from fractions of a percent upward, the hydrogen to phenyl acetylene ratio would necessarily be within the claimed range. The process may be conducted with a fixed bed of catalyst. The product from the process contains essentially no phenyl acetylene. The catalyst can be reactivated to renew its activity by a process that includes treating the catalyst in air at elevated temperatures followed by reduction with hydrogen at elevated temperatures. See page 1, left column, lines 1-52; page 1, right column, lines 1-14, 25-28, and 40-44; page 2, left column,

lines 25-40 and 60-75; page 2, right column, lines 1-19 and 31-51; page 3, left column, lines 7-60; page 4, right column, lines 18-46 and 57-75; and page 5, left column, lines 1-3.

The Smoker reference does not disclose the nickel content of the catalyst as in claims 1 and 2, does not disclose an alumina carrier, does not disclose supplying the styrene-containing stream and hydrogen to the bottom of the reactor, does not disclose the claimed LHSV range, and does not disclose the claimed reaction periods without regeneration of the catalyst.

The Gattuso reference discloses a process for selectively hydrogenating compounds containing triple bonds to the corresponding monoolefinic compound by contacting the triple bond containing compounds and hydrogen with a catalyst at hydrogenation conditions. A specifically disclosed application of the process is the selective hydrogenation of phenyl acetylene to styrene. The catalyst used in the process comprises nickel supported on alumina. The amount of nickel in the catalyst ranges from about 1 to 25 weight percent. The alumina in the support may be essentially gamma alumina. The hydrogenation temperature is between about 25° and 350°C and the LHSV is above 1.0 hr^{-1}. The process is conducted in a fixed bed reactor with the reactants flowing upward through the reactor. See col. 1, lines 16-36; col. 2, lines 25-36; col. 3, line 18 through col. 4, line 59; col. 6, lines 17-22; and col. 6, line 62 through col. 7, line 23.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Smoker by utilizing a catalyst that contains nickel in the amounts claimed as suggested by Gattuso because these amounts result in a catalyst that would be expected to effectively hydrogenate the phenyl acetylene.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Smoker by utilizing a gamma alumina support as suggested by Gattuso because Smoker discloses that any type of catalyst carrier can be used and because gamma alumina is shown to be an effective support in hydrogenation catalysts.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Smoker by supplying the styrene-containing stream and hydrogen to the bottom of the reactor as suggested by Gattuso because good mixing of the reactants will result.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Smoker by utilizing the LHSV values suggested by Gattuso because the use of these conditions would result in the expectation of effective hydrogenation.

The use of the catalyst of Smoker as modified by Gattuso in the process of Smoker would provide process run lengths within the claimed ranges.

Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smoker (2,399,514) in view of Gattuso et al. (4,734,540) as applied to claim 1 above, and further in view of Barry (2,511,453).

As discussed above, neither the Smoker nor the Gattuso reference discloses an additional metal in the catalyst as in claim 13 or the presence of steam during regeneration as in claim 16.

The Barry reference discloses a selective hydrogenation catalyst that comprises nickel supported on a carrier. The catalyst may also contain an additional metal such as gold or

chromium. The catalyst may be used to hydrogenate phenyl acetylene in the presence of styrene. The catalyst may be regenerated by contacting it with air followed by reduction with hydrogen. It may also be regenerated by a steam treatment. See col. 5, line 28 through col. 6, line 16, col. 7, lines 26-33, and col. 8, lines 16-31.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by including an additional metal such as gold or chromium as suggested by Barry because these additional metals promote the desired effect of selective hydrogenation.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by including a steam treatment during the regenerating of the catalyst as suggested by Barry because steam treatment effectively regenerates catalysts similar to those disclosed by Smoker and combining steam treatment with the oxidation and reduction treatments of Smoker would result in the expectation that a more thoroughly regenerated catalyst would be produced as compared to a catalyst that is regenerated by only an oxidation and reduction treatment.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Platz reference discloses the hydrogenation of phenyl acetylene using a nickel catalyst. See column 2, lines 9-35 and 60-72 and column 3, lines 1-5.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is 703-305-3774. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

Walter D. Griffin
Primary Examiner
Art Unit 1764

WG
August 28, 2002